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IMAGE FILE DEVICE

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IMAGE FILE DEVICE

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Claim

A type of image file device characterized by the following facts: the image file device has an image input means that inputs image data, an information input means that inputs retrieval information of the image data and information relating to the recording length of the image data, a first storage means of the write-once type that stores the input image data, a second storage means that stores the input retrieval information, a retrieval means that performs retrieval of the image based on said retrieval information, a recording length setting means that sets the

recording length of the image data based on the information relating to the recording length of said image data, a remaining quantity storage means that stores the remaining capacity of said first storage means, a computing means, which computes the remaining number of images that can be stored in said first storage means in said image data length from said preset recording length and said remaining storage capacity, and, at the same time, which outputs the remaining storage capacity of the first storage means to said remaining quantity storage means, and a display means that displays the image data and the retrieval information; by means of the output from said computing means, the number of remaining images that can be recorded in the first storage means is displayed on said display means.

Detailed explanation of the invention

Industrial application field

This invention pertains to a type of image file device that has image or other information input to it, and forms files for the images stored in an optical disk or another write-once type medium.

Prior art

Image file devices that can record a large quantity of images in an optical disk or another recording medium and perform retrieval of the recorded images instantly have been developed. For an image file device, when images are recorded, the user can change the image recording format into various types. For example, the user can select the pixel number, compression number, resolution, color or monochromatic (hereinafter to be referred to as recording mode) of the image at will, so that images are recorded in various formats in the recording medium.

Figure 4 is a diagram illustrating schematically a conventional image file device.

The retrieval information for retrieval of an image, the recording mode for recording of the image, and other information are input to information input part (1), and the input information is sent through controller (2) and is recorded in information storage part (3). An image input from image input part (4) is displayed via frame memory (5) on display part (6), and it is converted corresponding to the recording mode input to the information input part and is stored in image storage part (7).

When the image stored in image storage part (7) is retrieved, the retrieval information is input from information input part (1), and, based on the retrieval information, controller (2) compares it with the retrieval information stored in information storage part (3) so as to perform retrieval of the image stored in image storage part (7).

Problems to be solved by the invention

However, while the mode for recording the image can be set at will, the recording length for each image varies corresponding to the recording mode. Consequently, the number of additional images that can be stored in the remaining storage capacity is unknown. This is undesired.

The objective of this invention is to solve the aforementioned problem of conventional methods by providing a type of image file device that can display the number of images that can be recorded corresponding to change in the recording length when the recording length for each image is changed.

Means for solving the problems and operation

In order to solve the aforementioned problem, this invention has the following means.

Figure 1 is a diagram illustrating the constitution of this invention.

This invention provides a type of image file device characterized by the following facts: the image file device has an image input means that inputs image data, an information input means that inputs retrieval information of the image data and information relating to the recording length of the image data, a first storage means of the write-once type that stores the input image data, a second storage means that stores the input retrieval information, a retrieval means that performs retrieval of the image based on said retrieval information, a recording length setting means that sets the recording length of the image data based on the information relating to the recording length of said image data, a remaining quantity storage means that stores the remaining capacity of said first storage means, a computing means, which computes the remaining number of images that can be stored in said first storage means in said image data length from said preset recording length and said remaining storage capacity, and, at the same time, which outputs the remaining storage capacity of the first storage means to said remaining quantity storage means, and a display means that displays the image data and the retrieval information; by means of the output from said computing means, the number of remaining images that can be recorded in the first storage means is displayed on said display means.

Application examples

Figure 2 is a diagram illustrating the constitution of an application example of the image file device of this invention.

Information input part (8) is made of a keyboard or another input device. It is used in performing input of various types of information, such as input of an ID No., date, name, and other retrieval information corresponding to various image data for retrieval of the image data, input of instructions for storing the image data, instructions for setting the recording mode of the

image data (for example, number of pixels that form the image, compression rate of data compression, color or black and white), retrieval instructions of the image data, etc. The image data input from image input part (9) of a TV camera or the like are temporarily stored in frame memory (10), and the temporarily stored image data are stored in image storage part (11) as first storage means using an optical disk or another write-once type recording medium. By means of a magnetic disk or another re-writable recording medium, the retrieval information input from said information input part (8) is recorded in information storage part (12) as a second storage means. Also, in this application example, remaining quantity storage part (13) is set in said information storage part (12).

Controller (14) receives the information input from information input part (8), and it sends control signals for controlling said various means. Also, said controller (14) contains a retrieval means that performs retrieval of the image information.

The retrieval information stored in said information storage part (12) is placed in correspondence with the image data stored in image storage part (11), and it is managed by means of controller (14).

Recording length setting means (100) that sets the recording length for each recording mode includes three registers (15), (16), (17) that store the recording mode, data recording length computing table (19) that stores the data of the image data recording length corresponding to each recording mode, and adder (18) for determining the data recording length in the table from the contents stored in said registers.

Remaining quantity storage means (200) is composed of selector (20) that outputs data recording length B or 0 as the value corresponding to image recording or change in mode, and subtractor (21) that subtracts the output of selector (20) from remaining capacity A of the recording medium stored in remaining quantity storage part (13) and input via controller (14) and outputs the result as the current remaining capacity A. Output remaining capacity A is stored via controller (14) in remaining quantity storage part (13), and, at the same time, it is input to computing means (300).

Computing means (300) consists of divider (22). It divides remaining capacity A output from remaining quantity storage means (200) by data recording length B output from recording length setting means (100), and outputs the remaining recordable image number.

Display part (23) is made of a CRT or another display device. The image data input from image input part (9) or the retrieval image data retrieved with image storage part (11) are displayed through frame memory (10). The remaining recordable image number output from computing means (300), the input retrieval information, etc. are also displayed on said display part (23). Also, in this application example, the retrieval information is displayed on another display device other than the display device that displays the image.

For the image file device with said constitution, the retrieval information from information input part (8) is input to controller (14). By means of said controller (14), the retrieval information stored in information storage part (11) is retrieved, and information in agreement with the input retrieval information is extracted. The image data corresponding to the extracted retrieval information are extracted from information storage part (11), and the retrieved image data are displayed on display unit (23) via frame memory (10).

When the image data is registered in image recording part (11), the information for retrieval is stored in information storage part (12), and, at the same time, based on the information of the recording mode of the image data, or, more specifically, the contents of registers (15), (16), (17), controller (14) controls image input part (9) and frame memory (10), and stores the image data in image storage part (11).

In the following, the operation of registration of the image data will be explained in more detail.

In this application example, for the recording mode selected for the recording image, the following three modes can be selected.

(1) The structural pixel number of the image is 640x480 pixels or 320x240 pixels. (In this case, the ratio of the data recording length is 4:1).

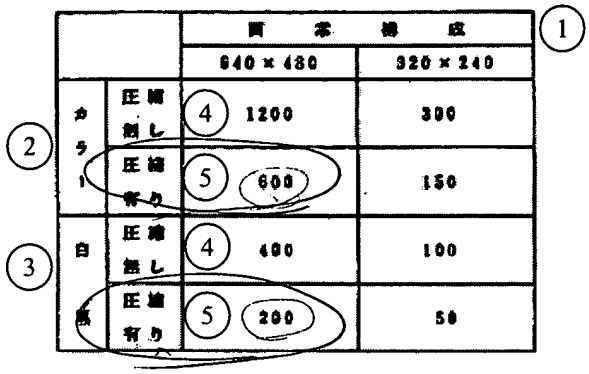
(2) Data compression is not performed, or data compression is performed at a compression rate of ½ (in this case, the ratio of the data recording length is 2:1).

(3) Recording of the image is performed as black and white, or as a color image. (When color recording is performed, the image is decomposed into the three primary colors RGB. In this case, the ratio of the data recording is 1:3).

By means of a combination of said three modes, the data recording length can be selected from the 8 types listed in Table 1.

In order to simplify the situation, the recording length when the image has 320x240 pixels, is free of data compression, and is in black and white is taken as 100, and the various values are listed in the table.

Table 1



Key: 1 Pixel constitution
2 Color
3 Black and white
4 Free of compression
5 With compression

The 8 data recording length values are summarized in Table 2, a data recording length computing table.

Table 2

1					
2		100	300	50	150
3		4	5	6	7
4		400	1200	200	600

Key: 1 Sequential No.
2 Recording length
3 Sequential No.
4 Recording length

In addition, for the contents of the various modes, the value of each FLAG register is set at 0 or 1, that is, the structural pixel number is set in PICTFLAG register (15) (0: 320x240 pixels; 1: 640x480 pixels); presence/absence of data compression is set in COMPFLAG register (16) (0: without compression; 1: with compression); and color or black and white is set in COLFLAG register (17) (0: black and white; 1: color).

In this way, the values of the various FLAGs are determined, and the data recording lengths are set side-by-side in Table 2 corresponding to Table 1.

PICTFLAG × 4 + COMPFLAG × 2 + COLFLAG ..... (1)

The data recording length of the sequential No. equal to the value computed with said equation is taken as the current data length.

For example, in the case with structural pixel number at 640x480 pixels, with no data compression, and with color recording, the values of the image FLAGs are set as follows: PICFLAG = 1, COMPFLAG = 0, and COLFLAG = 1. According to Equation (1), value 5 (1x4+0x2+1 = 5) is output. As a result, the data recording length stored in the 5th column of Table 2 is selected, and the value of 1,200 is output as the current data recording length.

In this way, the data recording length of each image determined as above and the remaining capacity of the storage device stored in remaining quantity storage part (13) are used in computing using the computing means to determine the remaining recordable image number, which is then displayed on the display means.

Figure 3 is a flow chart illustrating execution of the aforementioned operation. In this figure, S_0-S_{12} represent the steps of the flow chart.

First of all, in S_1, the structural pixel number is input through information input part (8), and, corresponding to the pixel number input in S_2, controller (14) sets PICTFLAG register (15). Then, in S_3, yes/no of data compression is input, and in S_4, controller (14) sets COMPFLAG register (16). Then, in S_5, color or black and white recording is input, and, just as in said cases, controller (14) sets COMFLAG register (17). In S_7, the values of said registers (15), (16), (17) set as aforementioned are used to compute the value using adder (18) by means of Equation (1). By means of the computed value, in S_8, the corresponding data recording length is selected from data recording length computing table (19), and this value is then stored as variable B.

Then, in S_9, judgment is made on whether an image is being recorded or the mode is being changed for determining the current remaining capacity of the storage device. In the case of image recording, data recording length B determined in S_8 is selected by selector (20) for output. On the other hand, in the case of mode change, value 0 is selected and output. In S_{10}, said output value B or 0 is subtracted by subtracting from remaining capacity A stored in remaining quantity storage part (13), and the result is stored in A and is output. Then, in S_{11}, by means of divider (22), said output remaining capacity A is divided by data recording length B to compute the remaining recordable image number. This result is output as C, and, in S_{12}, C is displayed on display part (23).

In said application example, there are 8 types of data recording length for the recording mode. Consequently, it is stored in a table. However, one may set the pixel constitution at will. When the data recording length is changed at will, it could have a higher efficiency by

computing each time instead of using a table. In this case, only the scheme in determining the data recording length is changed, while the overall procedure is the same.

Also, in the aforementioned application example, the image data and the retrieval information are displayed on different display parts. However, they may also be displayed on the same display part. That is, there may be a display means that can display both of them.

Effect of the invention

As explained above, according to this invention, even when the data recording length of each image is changed corresponding to the recording mode, the remaining recordable image number in the set recording mode still can be known.

Brief description of the figures

Figure 1 is a diagram illustrating the basic constitution of this invention. Figure 2 is a block diagram illustrating the constitution of an application example of this invention. Figure 3 is a flow chart illustrating execution of the invention. Figure 4 is a diagram illustrating the constitution of a conventional image file device.

8 Information input part
9 Image input part
11 Image storage part
12 Information storage part
23 Display part
100 Recording length setting means
200 Remaining quantity storage means
300 Computing means

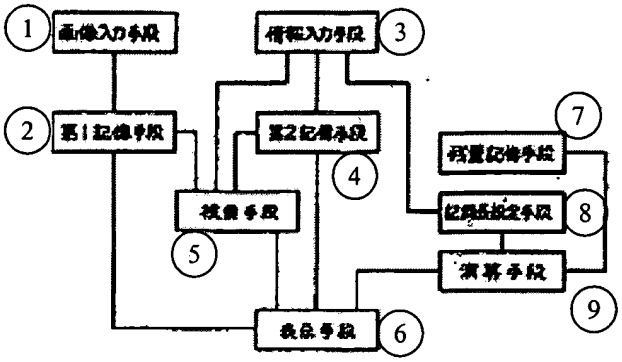


Figure 1

Key: 1 Image input means
2 First storage means
3 Information input means
4 Second storage means
5 Retrieval means
6 Display means
7 Remaining quantity storage means
8 Recording length setting means
9 Computing means

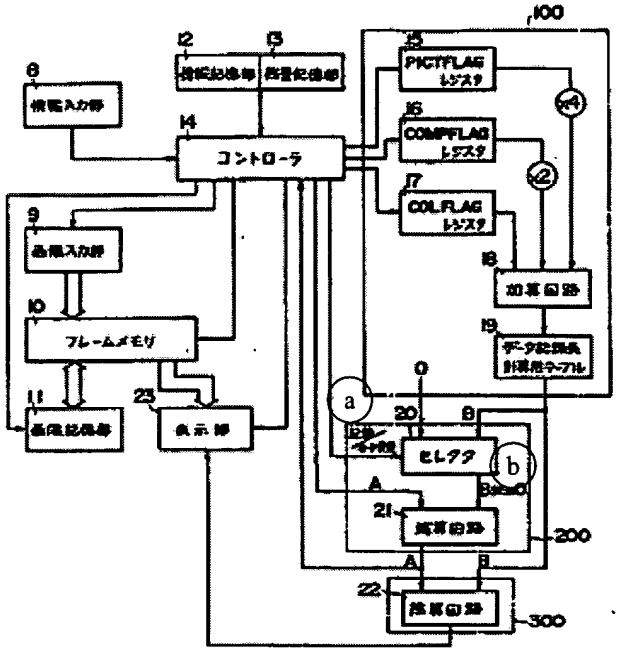


Figure 2

Key: a Recording/mode change
b B or 0
8 Information input part

9 Image input part
10 Frame memory
11 Image storage part
12 Information storage part
13 Remaining quantity storage part
14 Controller
15 PICTFLAG register
16 COMPFLAG register
17 COLFLAG register
18 Adder
19 Data recording length computing table
20 Selector
21 Subtractor
22 Divider
23 Display part

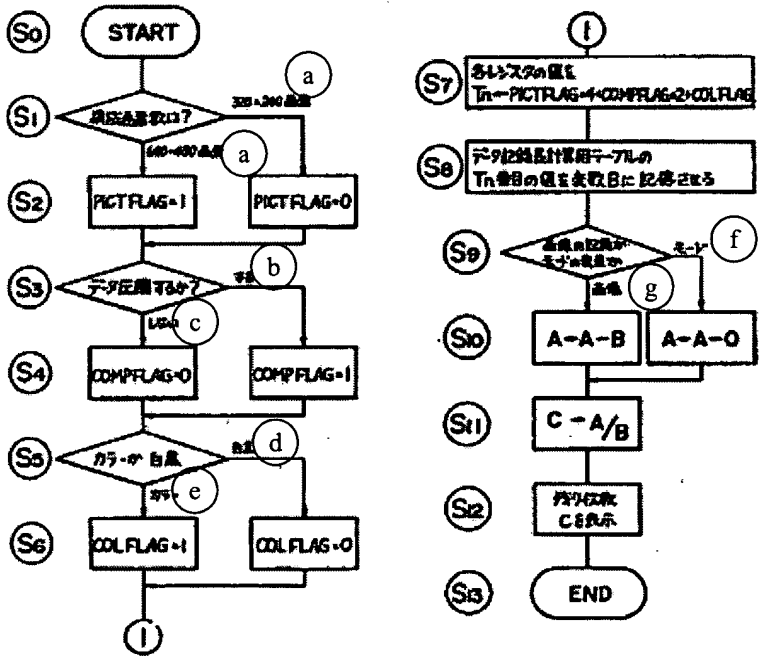


Figure 3

Key: S1 Structural pixel number?
S3 Data compressed?
S5 Color or black and white?
S7 For the value of each register
S8 Value of Tn in the data recording length computing table is stored in variable B.
S9 Image recording or mode change?
S12 Display of remaining image number C
a Pixels
b Yes

c No
d Black and white
e Color
f Mode
g Image

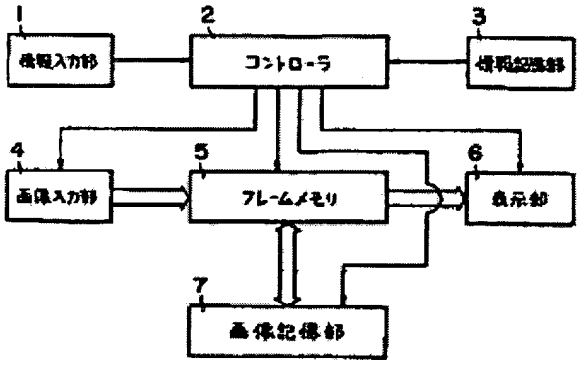


Figure 4

Key:
1 Information input part
2 Controller
3 Information storage part
4 Image input part
5 Frame memory
6 Display part
7 Image storage part